

WHAT IS CLAIMED IS:

1 1. A method of ensuring a requested Quality of
2 Service (QoS) for a media flow that is routed from a
3 first terminal in an originating network, through at
4 least one transit network, to a second terminal in a
5 terminating network, said originating network including
6 an Originating Bandwidth Broker (BB-O) and an Originating
7 Media Policy Server (MPS-O), said transit network
8 including a Transit Bandwidth Broker (BB-T) and a Transit
9 Media Policy Server (MPS-T), and said terminating network
10 including a Serving Bandwidth Broker (BB-S) and a Serving
11 Media Policy Server (MPS-S), said method comprising the
12 steps of:

13 sending an origination message from the originating
14 network to the terminating network with a proposed
15 session description that identifies the requested QoS;

16 determining by the terminating network that the
17 session description is agreeable;

18 sending a first Bandwidth Broker Protocol Resource
19 Allocation Request (RAR) from the BB-S to the BB-T with
20 binding information that identifies the first and second
21 terminals and the requested QoS;

22 determining by the BB-T whether a Service Level
23 Agreement (SLA) between the transit network and the

24 terminating network allows sufficient resources to be
25 allocated to meet the requested QoS;

26 sending a second RAR from the BB-T to the BB-O with
27 the binding information, upon determining by the BB-T
28 that the SLA between the transit network and the
29 terminating network allows sufficient resources to be
30 allocated to meet the requested QoS;

31 reserving the resources required to meet the
32 requested QoS in the originating network, the transit
33 network, and the terminating network; and

34 setting up a multimedia session to carry the media
35 flow with the requested QoS.

1 2. The method of ensuring a requested QoS for a
2 media flow of claim 1 further comprising, after the step
3 of sending a second RAR from the BB-T to the BB-O with
4 the binding information, the steps of:

5 sending a first Resource Allocation Answer (RAA)
6 from the BB-O to the BB-T;

7 sending a second RAA from the BB-T to the BB-S; and
8 installing by the BB-O, the BB-T, and the BB-S,
9 applicable policies in edge routers to provide the
10 requested QoS in the originating network, the transit
11 network, and the terminating network, respectively.

1 3. The method of ensuring a requested QoS for a
2 media flow of claim 2 further comprising, before the step
3 of reserving the resources required to meet the requested
4 QoS, the steps of:

5 sending a QoS reservation request that includes the
6 agreed session description and the binding information
7 from an Originating Call State Control Function
8 (Originating P-CSCF) to the BB-O;

9 determining by the BB-O whether a previous valid
10 resource reservation exists for the session associated
11 with the binding information; and

12 sending an immediate successful reservation response
13 from the BB-O to the Originating P-CSCF, upon determining
14 that a previous valid resource reservation exists for the
15 session associated with the binding information.

1 4. The method of ensuring a requested QoS for a
2 media flow of claim 3 further comprising the steps of:

3 reserving resources required for the requested QoS,
4 upon determining that a previous valid resource
5 reservation does not exist for the session associated
6 with the binding information.

1 5. The method of ensuring a requested QoS for a
2 media flow of claim 4 wherein the step of determining by
3 the BB-O whether a previous valid resource reservation
4 exists includes the steps of:

5 determining whether a previous resource reservation
6 was made for the session associated with the binding
7 information; and

8 upon determining that a previous resource
9 reservation was made, determining from a time stamp
10 associated with the previous reservation whether the
11 previous reservation is still valid.

1 6. The method of ensuring a requested QoS for a
2 media flow of claim 3 wherein the step of sending the QoS
3 reservation request from the Originating P-CSCF to the
4 BB-O includes sending the QoS reservation request
5 utilizing a Common Open Policy Service (COPS) protocol
6 and a Bandwidth Broker protocol.

1 7. The method of ensuring a requested QoS for a
2 media flow of claim 1 further comprising the step of
3 creating the binding information from a source Internet
4 Protocol (IP) address of the first terminal, an
5 identification of a Real Time Protocol (RTP) port
6 assigned by the first terminal, a destination IP address

7 of the second terminal, and an identification of an RTP
8 port assigned by the second terminal.

1 8. A Multimedia Control Server (MMCS) in a multi-
2 service core network for ensuring a requested Quality of
3 Service (QoS) for a media flow being routed from a first
4 terminal in the core network to a second terminal in a
5 terminating network, said MMCS comprising:

6 an Originating Call State Control Function
7 (Originating P-CSCF) that serves the first terminal;

8 an Originating Bandwidth Broker (BB-O) that manages
9 resources in the originating network;

10 a first interface between the Originating P-CSCF and
11 the BB-O for passing binding information from the
12 Originating P-CSCF to the BB-O, the binding information
13 identifying the first and second terminals and the
14 requested QoS;

15 an Originating Media Policy Server (MPS-O) that
16 provides policy rules regarding allocation of resources
17 in the originating network;

18 a second interface between the MPS-O and the BB-O
19 for passing the policy rules from the MPS-O to the BB-O;
20 and

21 a third interface between the BB-O and a plurality
22 of edge routers that route the media flow into and out of
23 the originating network, said third interface for passing

24 from the BB-O to the edge routers, policy rules
25 applicable to a specific media flow.

26 9. A Multimedia Control Server (MMCS) in a multi-
27 service core network for ensuring a requested Quality of
28 Service (QoS) for a media flow from an application on a
29 first terminal that is transported through a network
30 owned by an administration, said media flow being routed
31 through at least one transit network that is not owned by
32 the same administration, to a second terminal in a
33 terminating network, said MMCS comprising:
34 an Originating Call State Control Function
35 (Originating P-CSCF) that serves the first terminal;

36 an Originating Bandwidth Broker (BB-O) that manages
37 resources in the originating network;

38 a first interface between the Originating P-CSCF and
39 the BB-O for passing a session description and binding
40 information from the Originating P-CSCF to the BB-O, the
41 binding information identifying the first and second
42 terminals and the requested QoS;

43 an Originating Media Policy Server (MPS-O) that
44 provides policy rules regarding allocation of resources
45 in the originating network;

46 a second interface between the MPS-O and the BB-O
47 for passing the policy rules from the MPS-O to the BB-O;

48 a third interface between the BB-O and a plurality
49 of edge routers that route the media flow into and out of
50 the originating network, said third interface for passing
51 from the BB-O to the edge routers, policy rules
52 applicable to a specific media flow; and

53 a fourth interface between the BB-O and a Transit
54 Bandwidth Broker (BB-T) in the transit network for
55 passing the binding information from the BB-T to the BB-
56 O, said binding information having been received by the
57 BB-T from a Serving Bandwidth Broker (BB-S) in the
58 terminating network.

1 10. The MMCS of claim 9 further comprising a fifth
2 interface between the MPS-O and a clearing house that
3 performs as an Authorization, Authentication, and
4 Accounting (AAA) server.

1 11. A system for ensuring a requested Quality of
2 Service (QoS) for a media flow belonging to an
3 application and originating in an originating network
4 owned by an administration, said media flow being routed
5 from a first terminal in the originating network through
6 at least one transit network that is not owned by the
7 same administration, to a second terminal in a
8 terminating network, said system comprising:

9 a first Multimedia Control Server (MMCS) in the
10 originating network comprising:

11 an Originating Call State Control Function
12 (Originating P-CSCF) that serves the first terminal;

13 an Originating Bandwidth Broker (BB-O) that
14 manages resources in the originating network;

15 a first interface between the Originating P-
16 CSCF and the BB-O for passing a session description and
17 binding information from the Originating P-CSCF to the
18 BB-O, the binding information identifying the first and
19 second terminals and the requested QoS;

20 an Originating Media Policy Server (MPS-O) that
21 provides policy rules regarding allocation of resources
22 in the originating network;

23 a second interface between the MPS-O and the
24 BB-O for passing the policy rules to the BB-O;

25 a plurality of originating edge routers that route
26 the media flow into and out of the originating network;

27 a third interface between the originating edge
28 routers and the BB-O for passing policy rules applicable
29 to specific media flows from the BB-O to the originating
30 edge routers;

31 a second MMCS in the terminating network comprising:

32 a Serving Call State Control Function
33 (Terminating P-CSCF) that serves the second terminal;

34 a Serving Bandwidth Broker (BB-S) that manages
35 resources in the terminating network;
36 a fourth interface between the Terminating P-
37 CSCF and the BB-S for passing an agreed session
38 description from the Terminating P-CSCF to the BB-S;
39 a Serving Media Policy Server (MPS-S) that
40 provides policy rules regarding allocation of resources
41 in the terminating network;
42 a fifth interface between the MPS-S and the BB-
43 S for passing the policy rules from the MPS-S to the BB-
44 S;
45 a plurality of serving edge routers that route the
46 media flow into and out of the terminating network;
47 a sixth interface between the serving edge routers
48 and the BB-S for passing policy rules applicable to
49 specific media flows from the BB-S to the serving edge
50 routers;
51 a Transit Bandwidth Broker (BB-T) in the transit
52 network;
53 a seventh interface between the BB-S and the BB-T
54 for passing the binding information from the BB-S to the
55 BB-T in a first Resource Allocation Request (RAR); and
56 an eighth interface between the BB-T and the BB-O
57 for passing the binding information from the BB-T to the
58 BB-O in a second RAR.